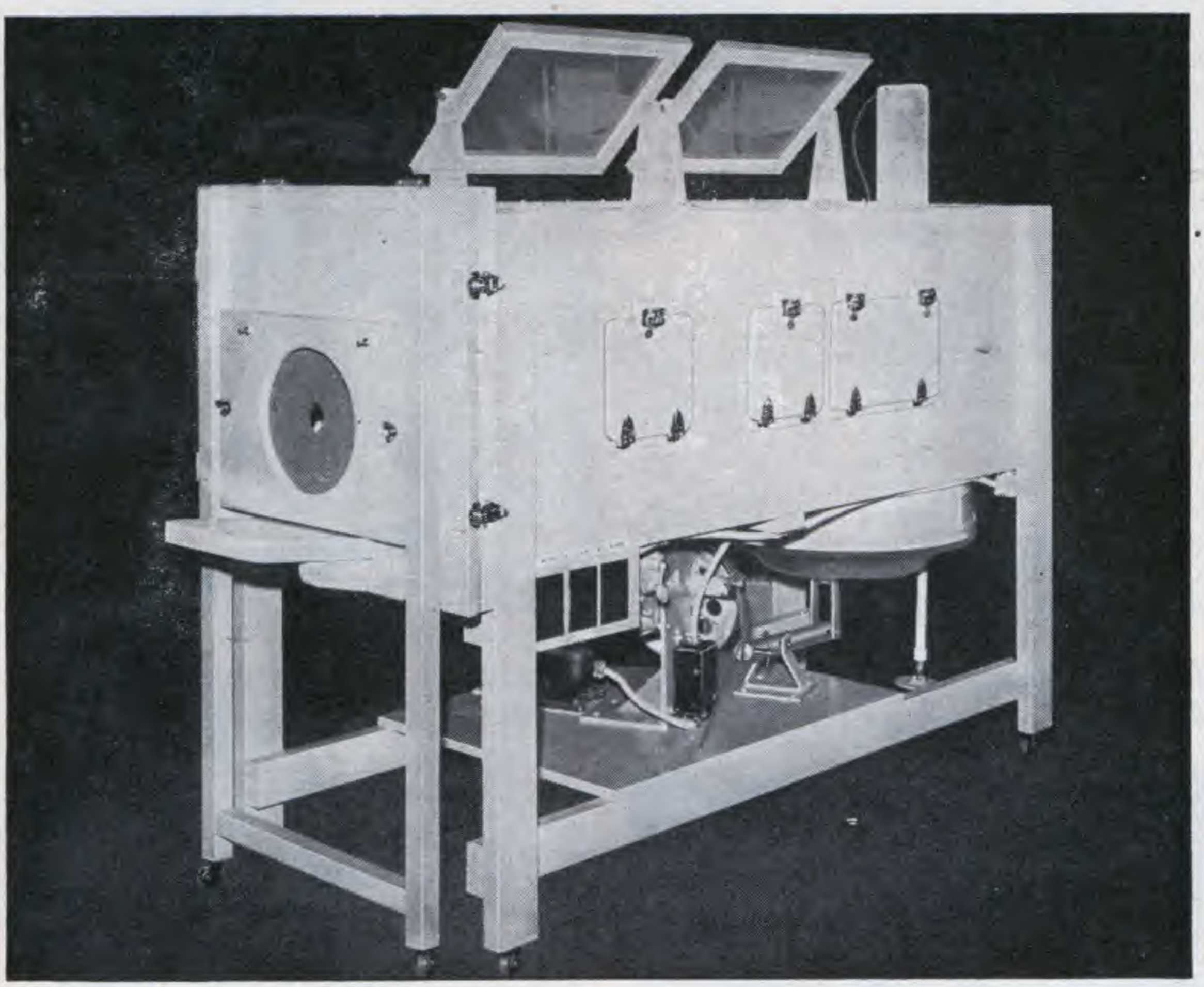
Emergency WOODEN



Could a life have been saved in your community if a mechanical respirator had been at hand for immediate use? Often just a matter of minutes means the difference between life or death for a little child stricken with polio, or a victim of drowning or a paralyzing accident. Here's a chance for every community to be ready at little expense for such emergencies. Members of clubs and civic organizations can do a great service by making one of these respirators and placing it in competent hands. Save a life — maybe your own

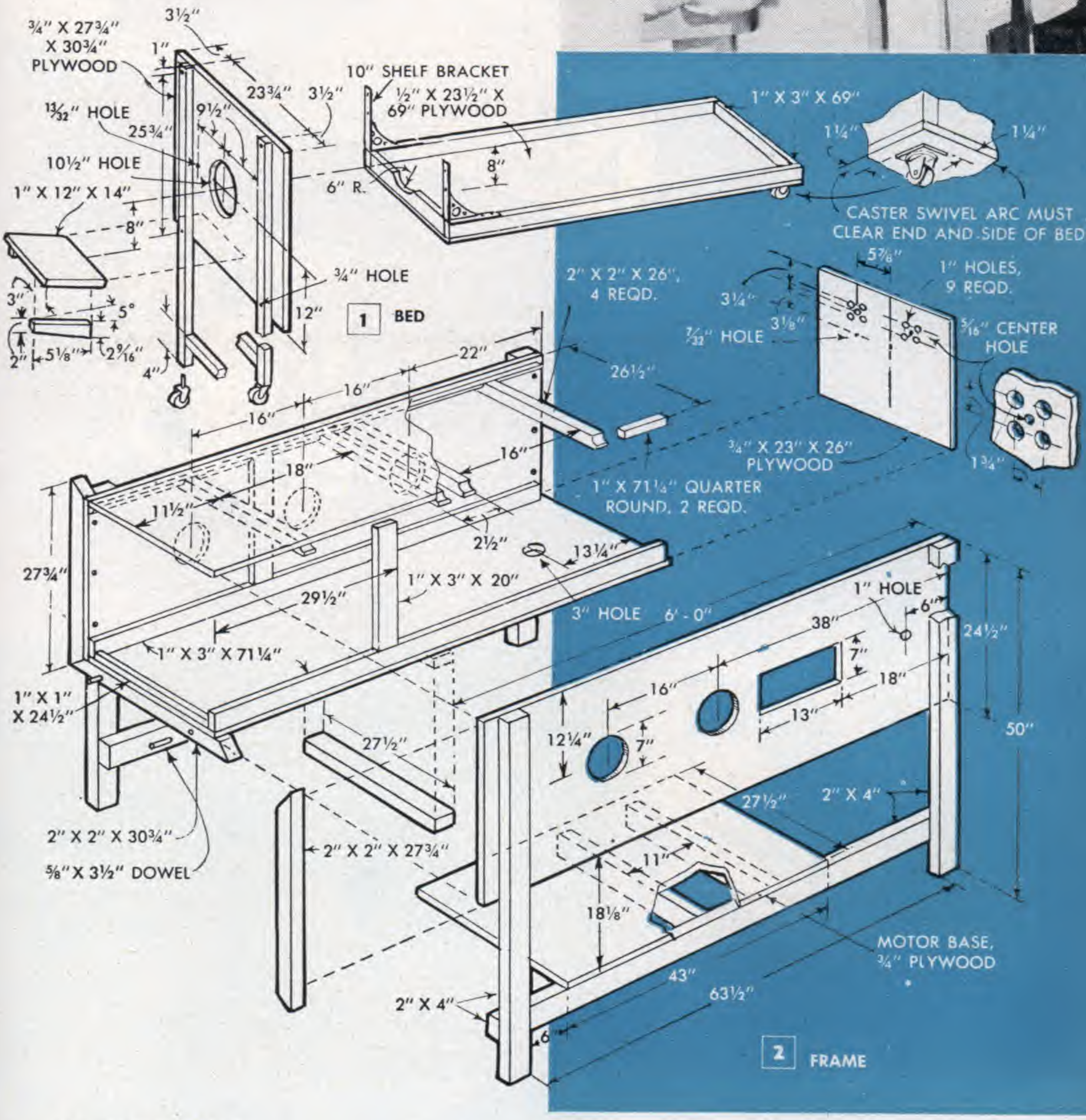
INTENDED only for emergency use until a commercial respirator could be obtained, this "wooden lung" was designed by engineers and built by a volunteer group under the supervision of Dr. Gerald M. Cline, Dr. Homer O. Dolley, and Sister Celine of the medical staff of St. Joseph's Hospital, Bloomington, Illinois. On completion, the unit was put into immediate use in emergency treatment of eight-year-old Rudy Landheer, a victim of polio in the epidemic of 1949. The original unit did emergency service for 12 hours until a conventional iron lung could be obtained.

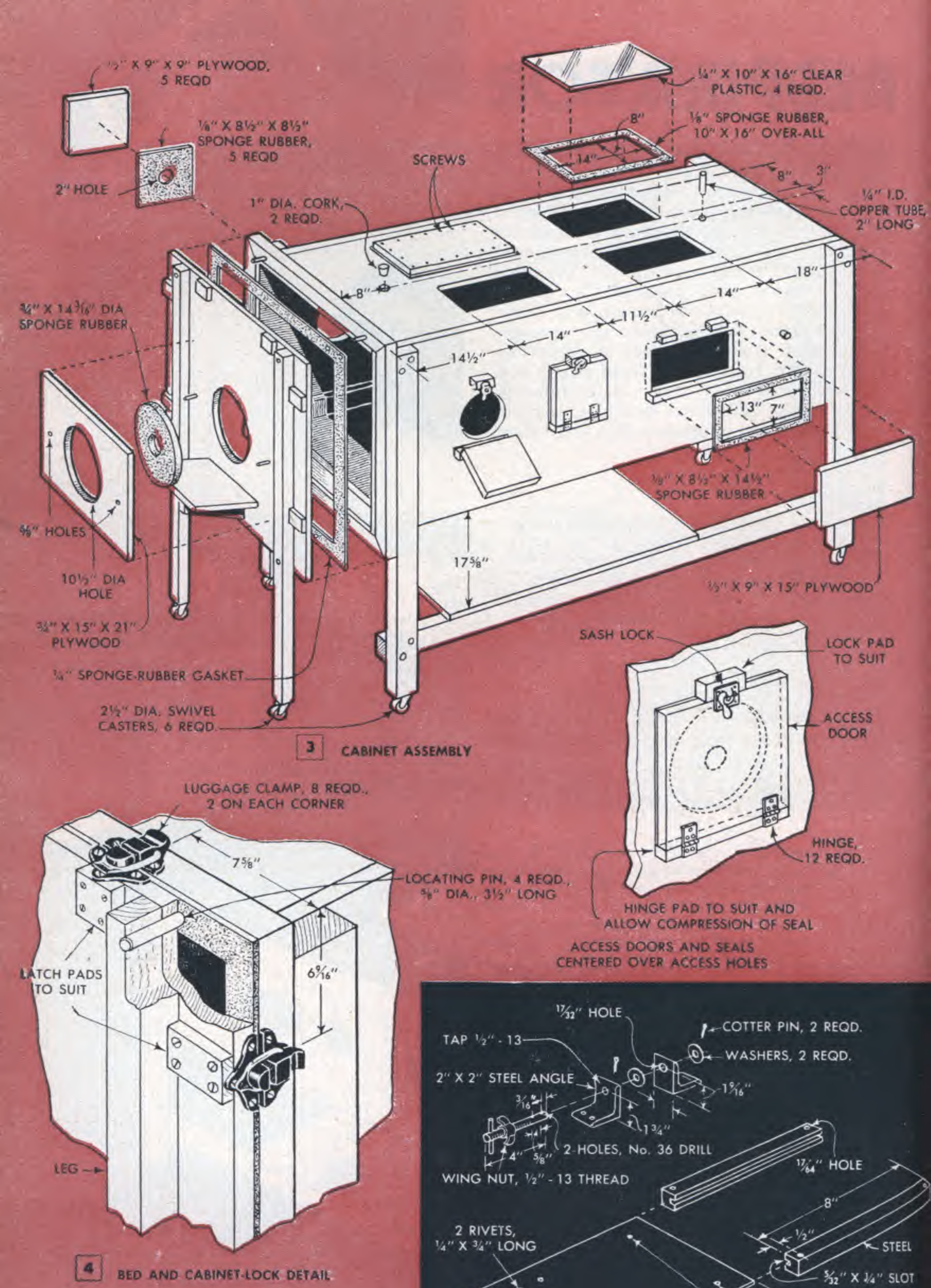
The unit, detailed on the following pages, has been approved only for emergency use under the direct supervision of a doctor or registered nurse. The motor-driven mechanism can be changed to hand operation in a few seconds, if necessary. As detailed, drive ratios have been arranged to give the proper diaphragm action, and a variable-speed pulley on the motor can be adjusted to give a respiratory frequency within the required range of 12 to 20 cycles per minute. The large sprocket on the final drive shaft has 26 teeth.

The cabinet and frame, Fig. 2, are of the simplest construction, all joints in the cabinet assembly being glued and screw-fastened. Note that the bed, Fig. 1, and the end panel and headrest are joined to form one unit which rolls on swivel casters. When the bed is in position in the cabinet, luggage clamps placed at the four corners hold the head panel, Fig. 4, and draw it

RESPIRATOR

tightly against the gasket. Note that all openings into the cabinet, Fig. 3, are fitted with gaskets and that the access doors are fitted with ordinary sash locks, which exert sufficient pressure on the gaskets to assure an airtight seal when the doors are closed and locked. The top openings into the cabinet are closed with clear-plastic panels screwed over sponge-rubber gaskets. Note that the clamp which holds the sponge-rubber head gasket in place is drilled to slip over two bolts in the head panel and is locked with wing nuts. Although the photo on page 262 shows two hanger bolts located above the wing nuts, two additional

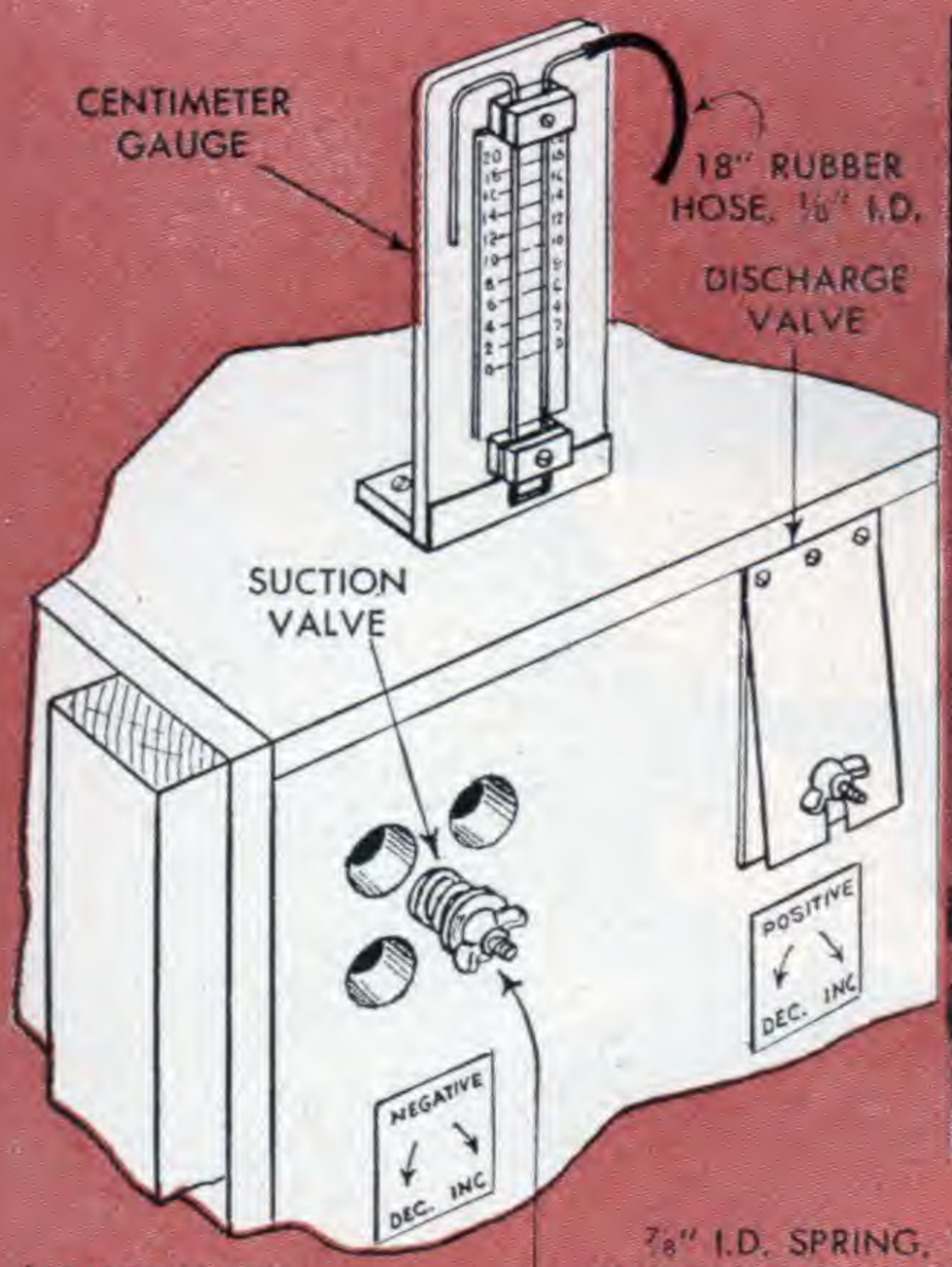


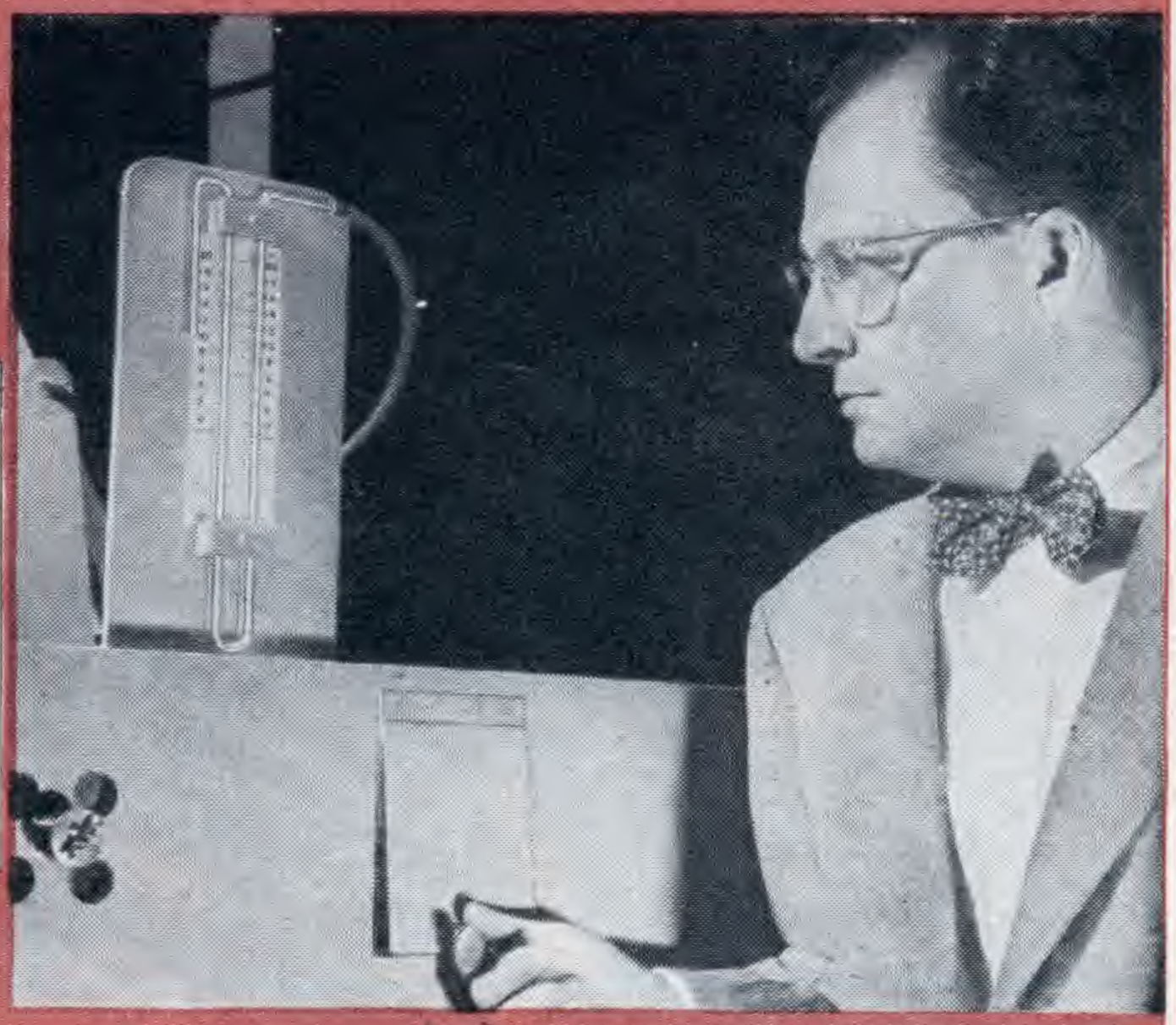


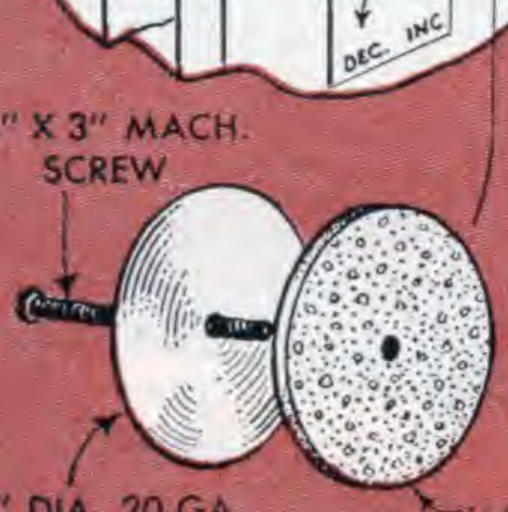
3 CABINET ASSEMBLY

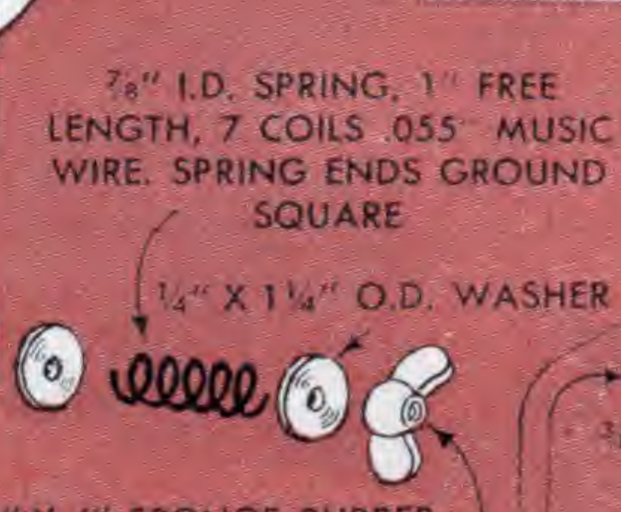
4 BED AND CABINET-LOCK DETAIL

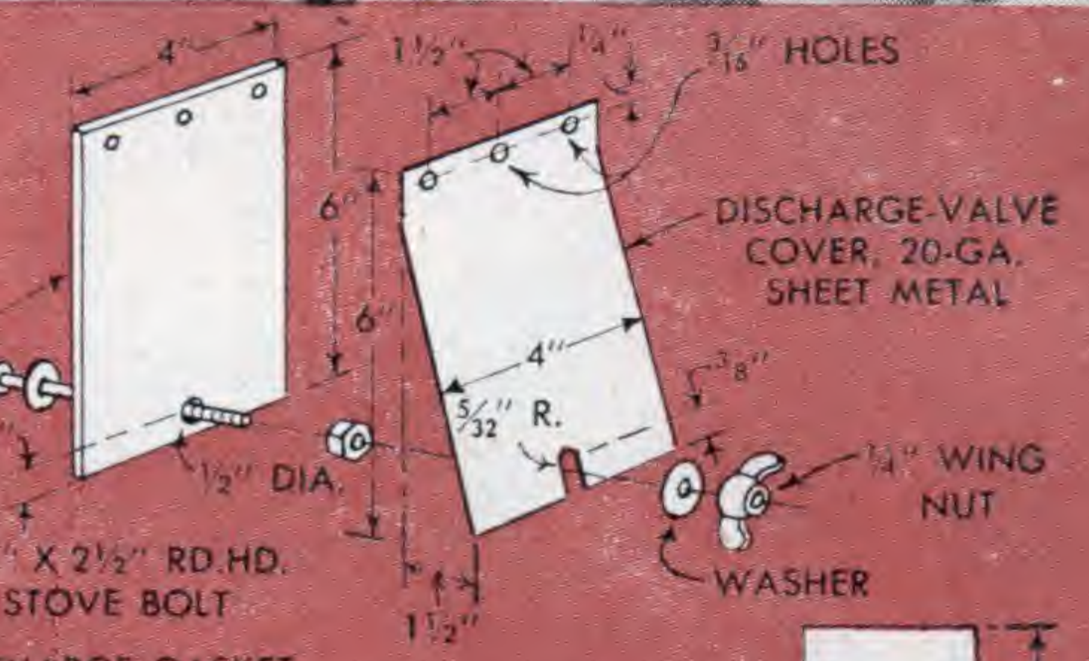
5 ADJUSTABLE MOTOR MOUNT

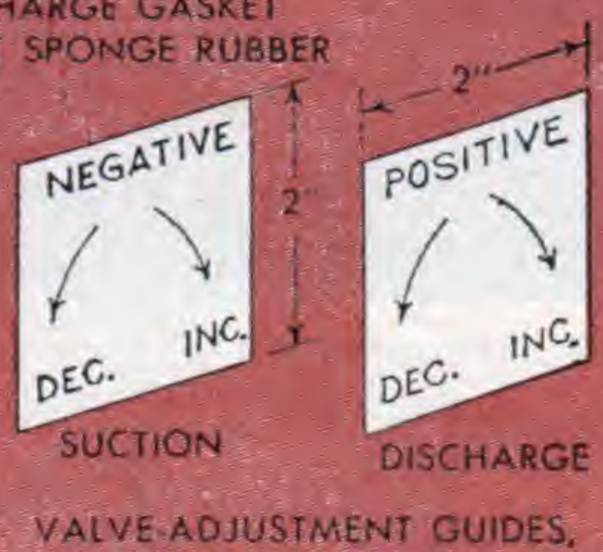


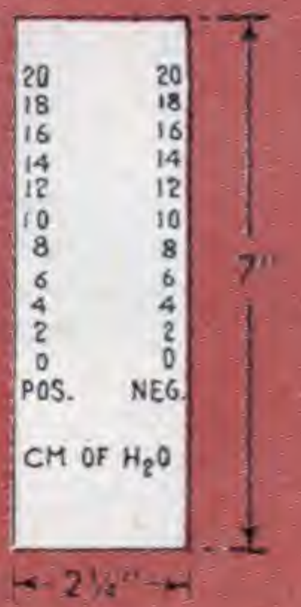




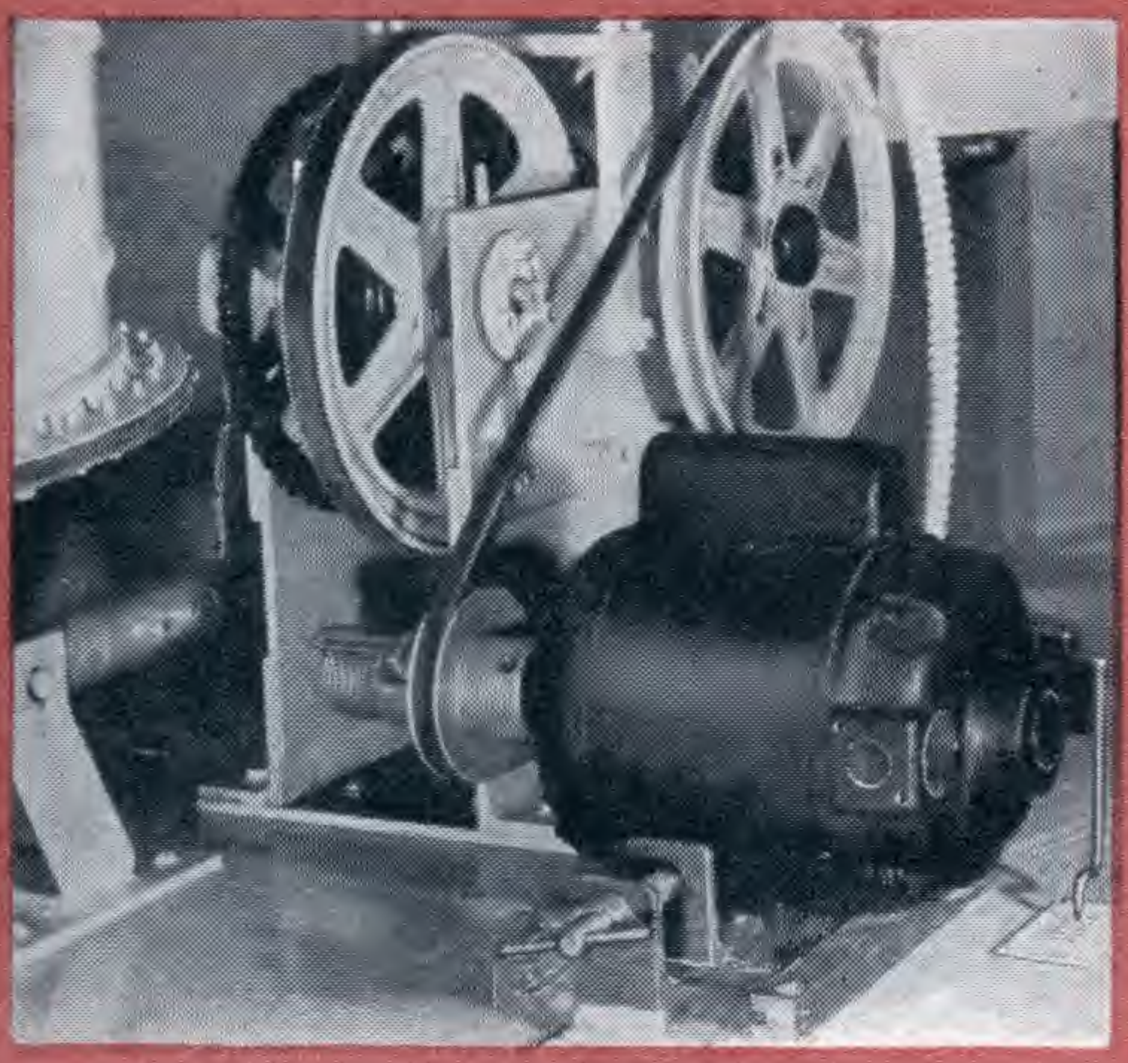


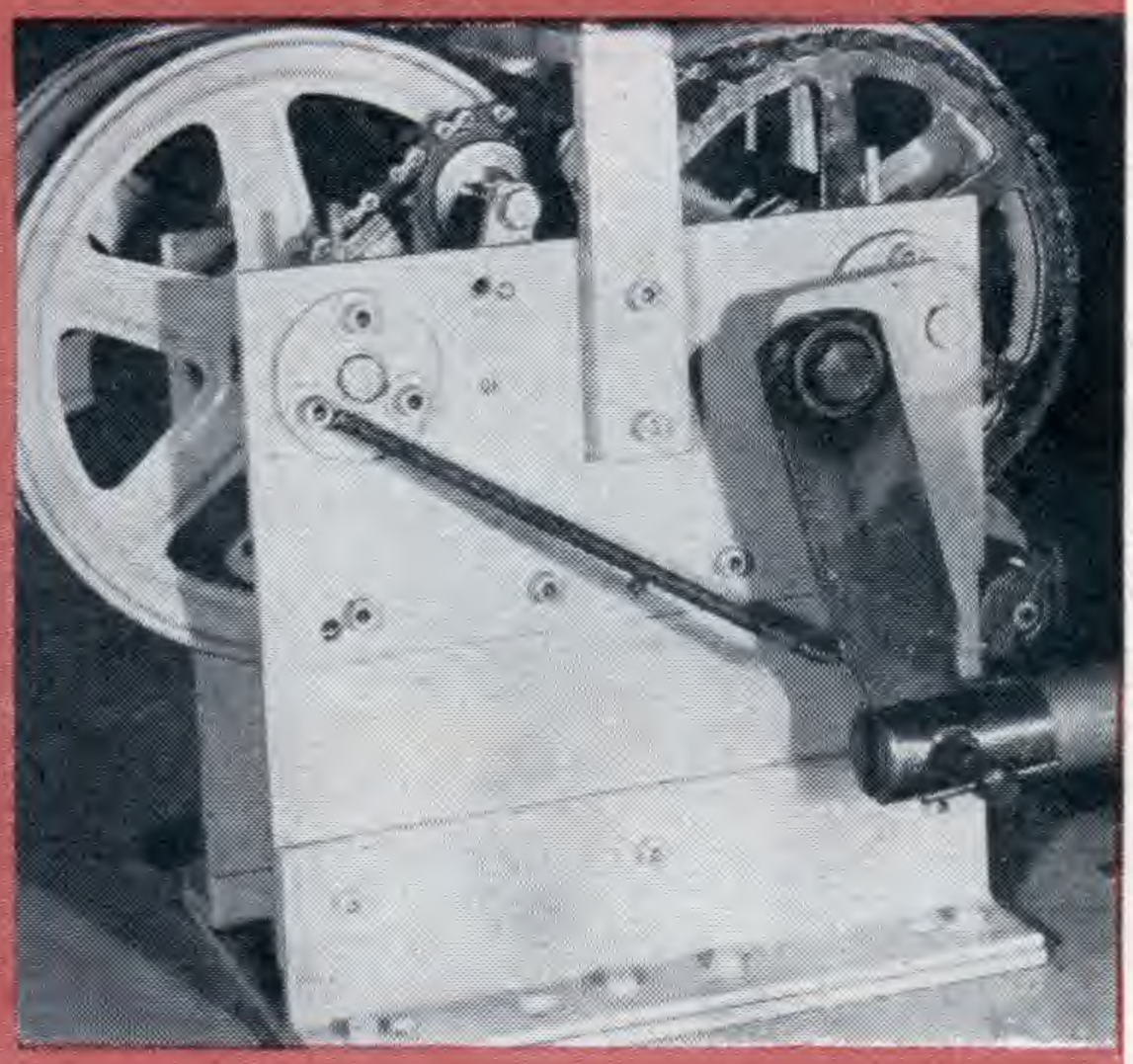


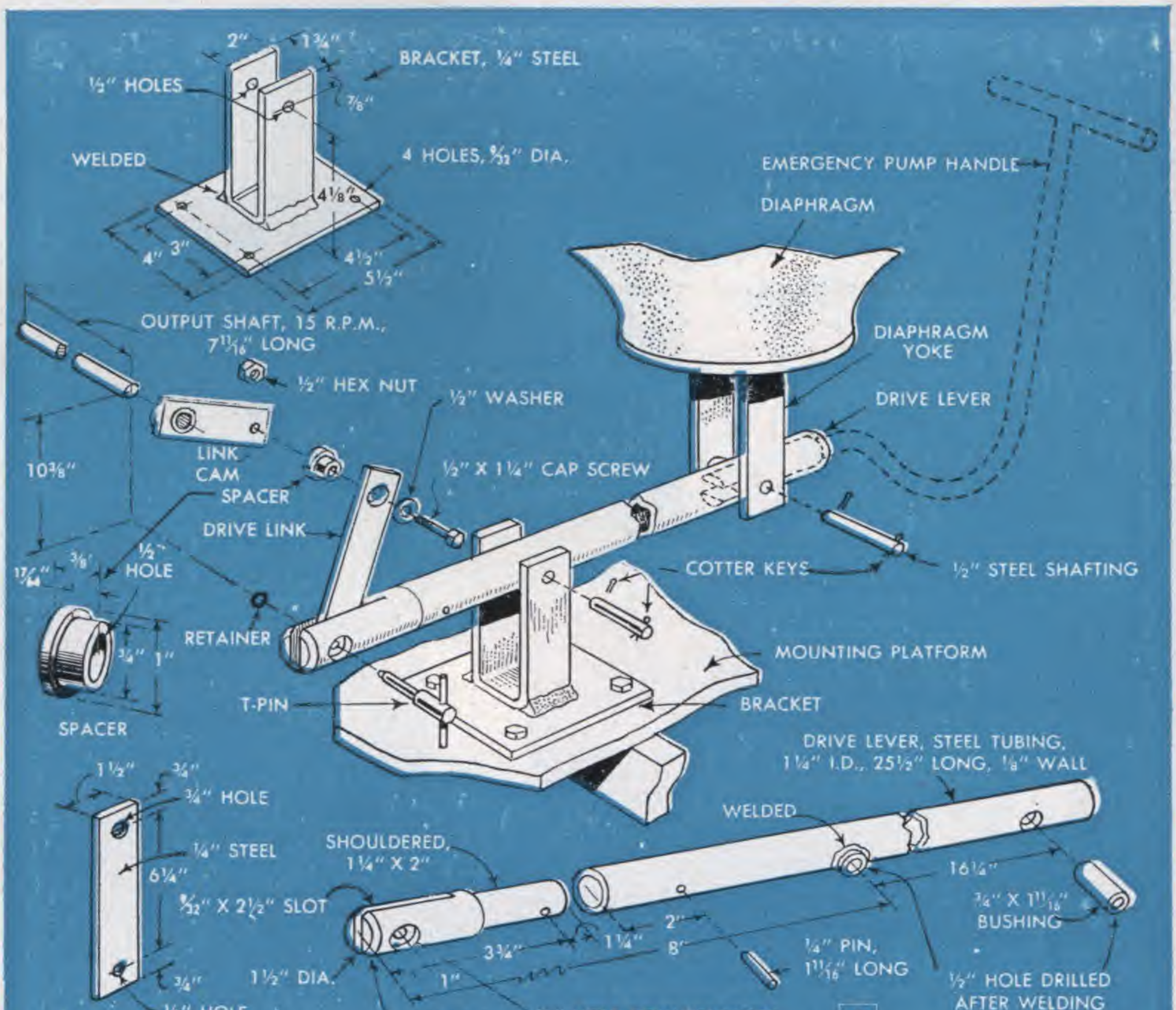




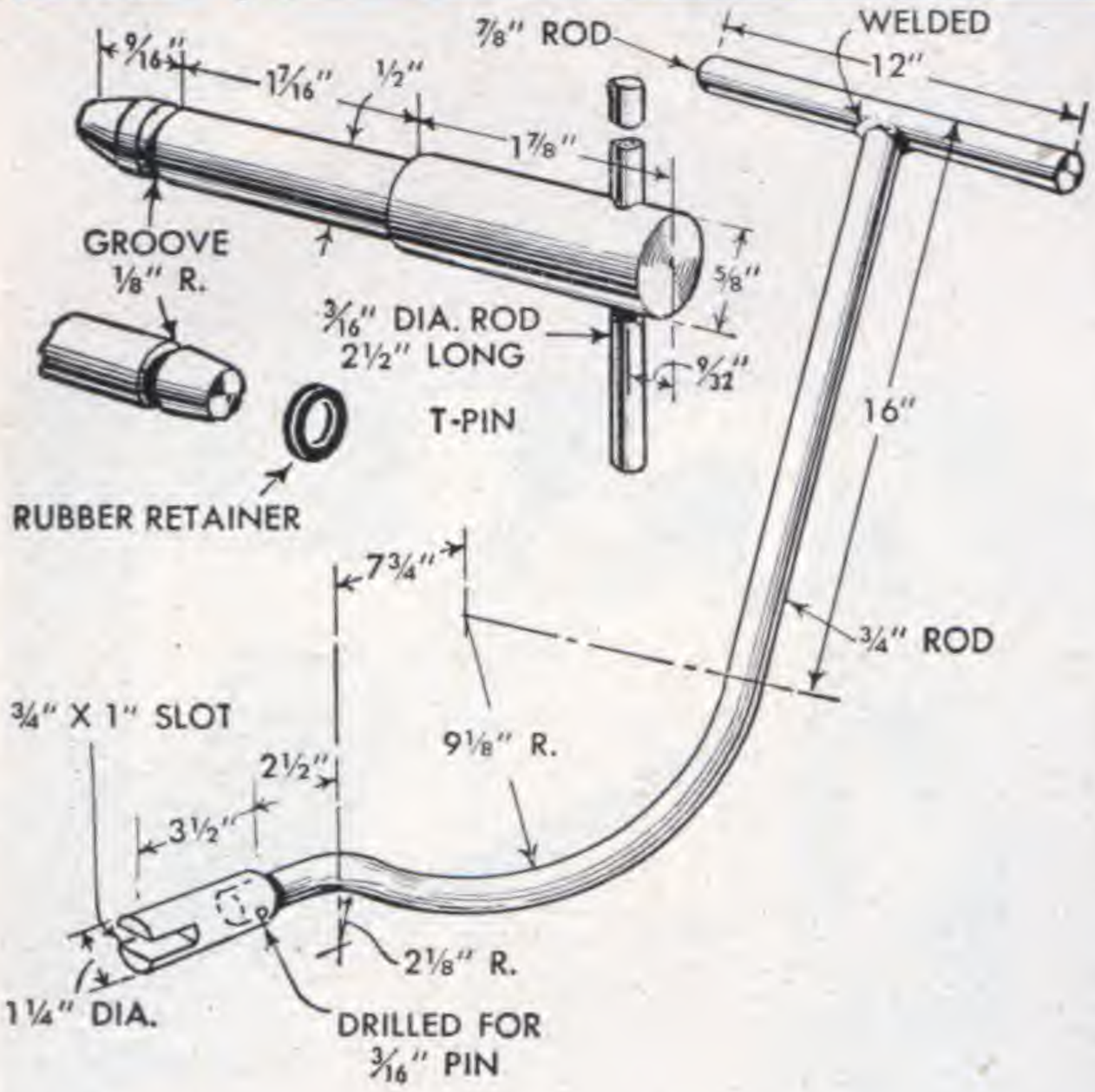
GAUGE AND VALVES



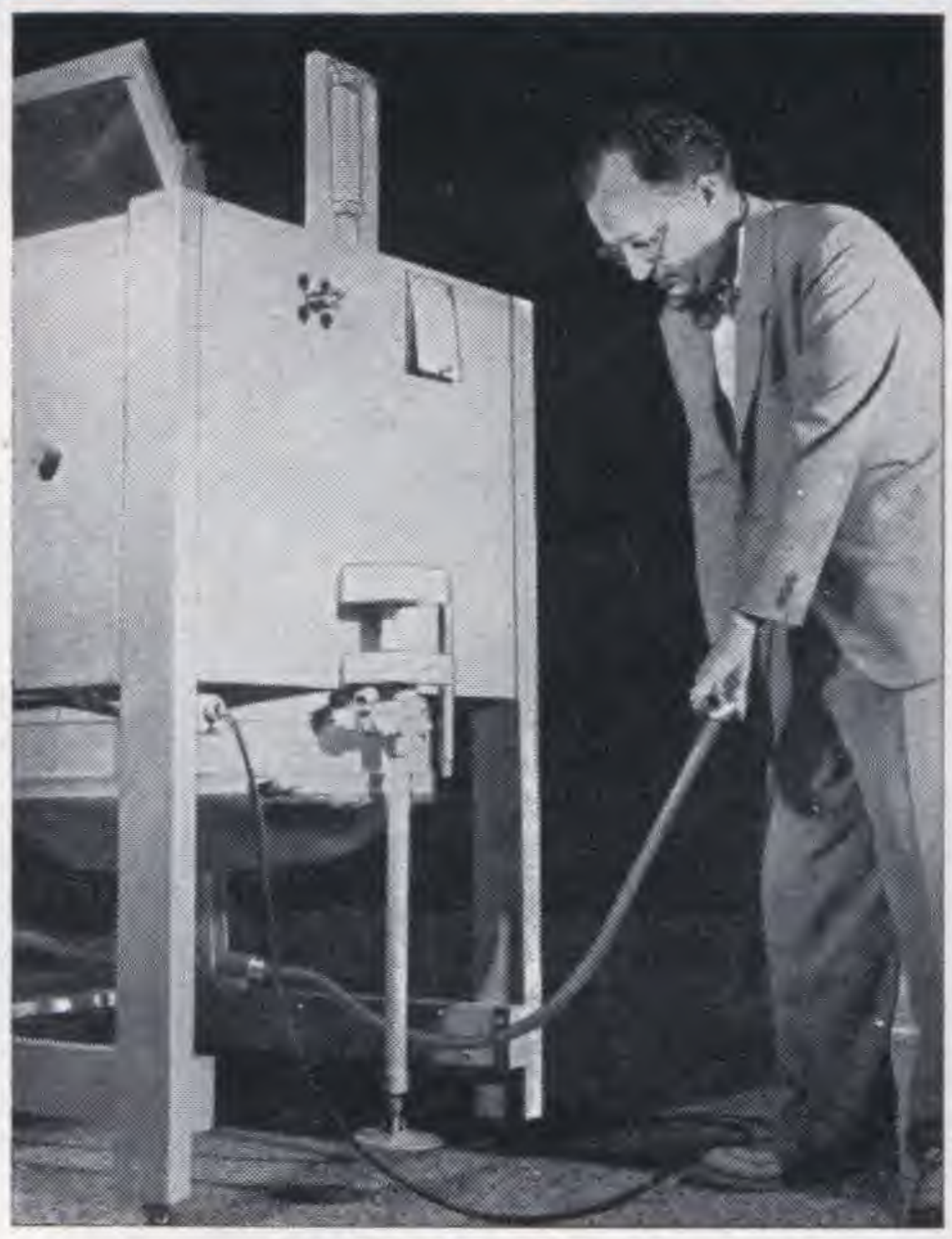


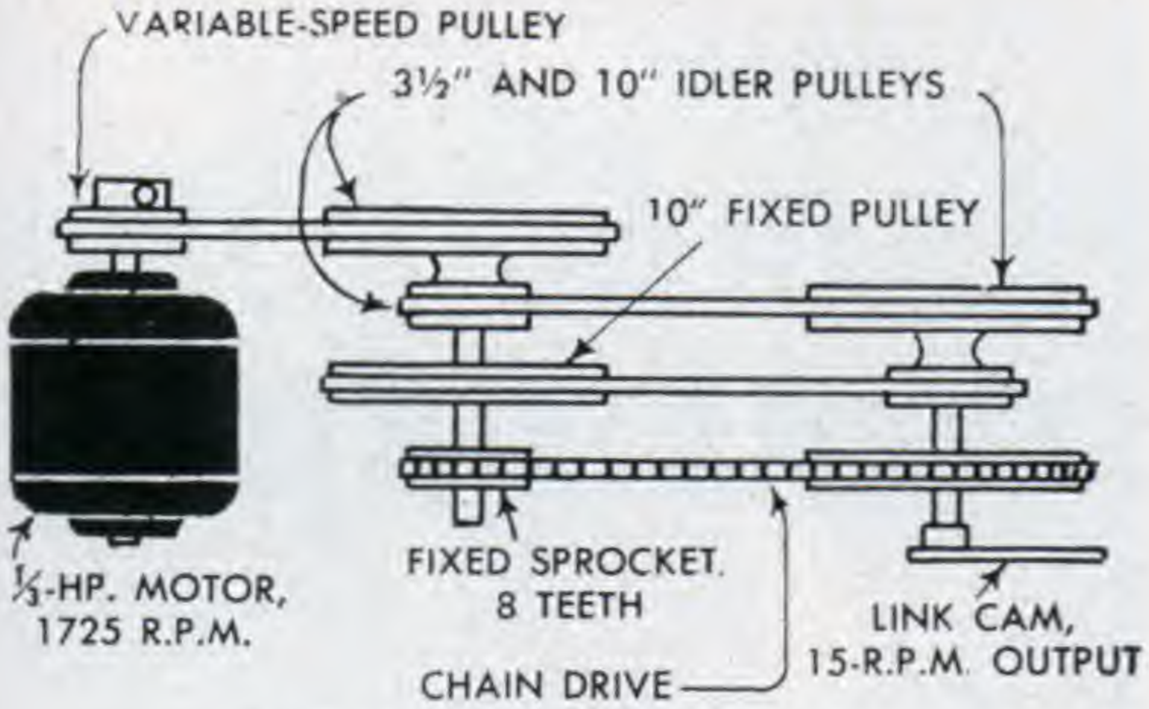


7 DRIVE-LEVER ASSEMBLY

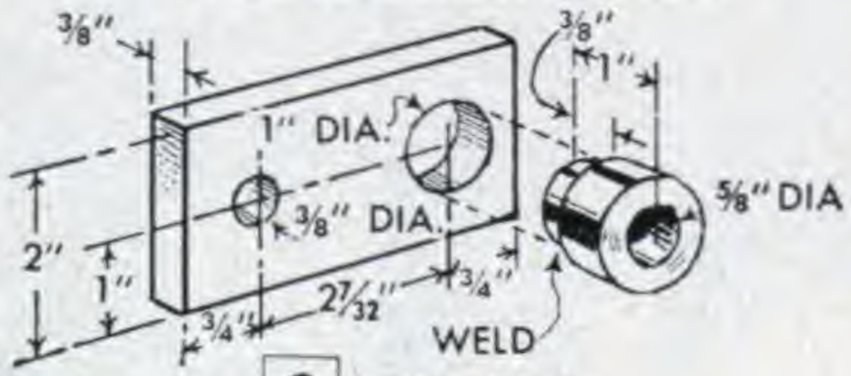


8 EMERGENCY PUMP HANDLE





SPEED-REDUCTION DIAGRAM

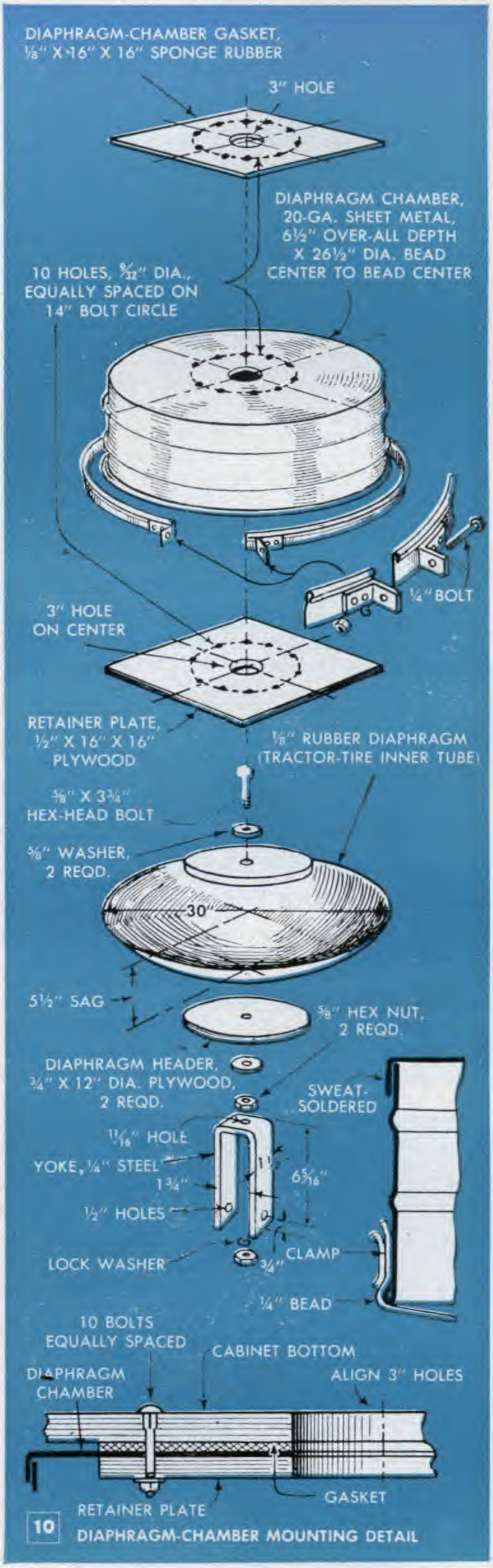


9 LINK CAM

bolts should be added below the wing nuts, to permit anchoring four straps to alleviate tension of the gasket on the patient's neck.

The base for the motor mount, Fig. 2, is screw-fastened to the frame stretchers and is reinforced with two crossmembers placed underneath with the ends joined to the stretchers. The motor mount, Fig. 5, is made entirely of metal and is provided with an adjusting screw so that the motor can be positioned and the belt properly tensioned in accordance with the setting of the variable-speed pulley. The slotted slides are bolted to the mounting base and care must be taken to position them properly so that the parts do not bind. The exact position of the motor mount on the base is determined by the location of the reduction drive unit, shown in working position in the two photos below Fig. 6. The reduction drive is connected to the drive lever, or rocker arm, by means of a link cam, Figs. 7 and 9, and a drive link, Fig. 7. The drive lever is pivoted in the manner detailed, one end being attached to the diaphragm yoke and the other pinned to the drive link by means of a removable T-pin, Fig. 8. Removal of the pin disconnects the power unit and permits hand operation of the diaphragm by the emergency handle.

Fig. 10 shows the construction and method of mounting the diaphragm chamber. The diaphragm is made from a section of tractor-tire inner tube, as specified, and is clamped onto the diaphragm chamber by means of a circular clamp. Note in the lower detail that a gasket is placed between the bottom of the cabinet and the top of the diaphragm chamber. The final fittings on the cabinet are the centimeter gauge, the inlet and discharge valves and the valve-adjustment guides, Fig. 6. The valves are located on the back panel of the cabinet.



10 DIAPHRAGM-CHAMBER MOUNTING DETAIL